Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ECO 141

Student ID\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Spring’16

**Homework 4**

1. In this problem you will start exploring economic determinants of terrorism. Is it poverty or political regimes? Or is it something else? To answer these questions you will take a look at some empirical evidence on cross-country sources of terrorism.

**DATA DESCRIPTION, FILE: terrorism.xls**

|  |  |
| --- | --- |
| **Variable** | **Definition** |
| *ftmpop* | Number of fatalities from terrorist incidents in the country, 1998-2004, per million population (U.S. State Department) |
| *gdppc* | GDP per capita in the country (World Bank) |
| *lackpf* | Index of the lack of political freedoms (Freedom House), 1-7 scale, 7 = extremely limited political freedoms |
| *ethnic* | Index of ethnic fractionalization (0 to 1 scale, 0 = no fractionalization) |
| *religion* | Index of religious fractionalization (0 to 1 scale, 0 = no fractionalization) |

1. Produce the scatterplot of *ftmpop* vs. *gdppc*.

**(4 p.)**

1. Generate the variables *lnftmpop* = ln(*ftmpop*) and *lngdppc* = ln(*gdppc*). Produce the scatterplot of *lnftmpop* vs. *lngdppc*.

**(6 p.)**

1. Produce the scatterplot of *lnftmpop* vs. *lackpf*.

**(5 p.)**

1. Using the scatterplots from (a) and (b), would you suggest using the variables *ftmpop* and *gdppc* or *lnftmpop* and *lngdppc* for modeling using linear regression?

**(4 p.)**

1. Using the scatterplot from (c), does the relation between *lnftmpop* and *lackpf* appear to be linear or nonlinear? If nonlinear, what sort of nonlinear curve might you want to explore (briefly explain)?
2. Table 1 presents the results of three regressions, one in each column. Estimate the indicated regressions and fill in the values (you may either handwrite or type the entries in

Estimate the regressions in Table 1 below and fill in the empty entries.

*Note*: for these regressions, only use the countries that have nonzero values of *ftmpop*.

**(*18 points*) Table 1**

**Determinants of Terrorism**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **(1)** | **(2)** | **(3)** |
| **Dependent variable:** | *lnftmpop* | *lnftmpop* | *lnftmpop* |
| **Regressor:** |  |  |  |
| *lngdppc* | ( ) | ( ) | ( ) |
| *(lngdppc)2* | \_\_ | ( ) | \_\_ |
| *lackpf* | \_\_ | --- | ( ) |
| *lackpf2* | \_\_ | \_\_ | ( ) |
| *ethnic* | \_\_ | \_\_ | ( ) |
| *religion* | \_\_ | \_\_ | ( ) |
| *Intercept* | ( ) | ( ) | ( ) |
| ***Regression summary statistics*** | | | | |
| *R*2 |  |  |  |
| *SER* |  |  |  |
| *n* |  |  |  |

*Notes*: standard errors are given in parentheses under estimated coefficients.

Use the results in Table 1 to answer the following questions.

1. Using regression 1, write down the regression in a normal form. Provide an interpretation of the coefficient on *lngdppc.* Is it statistically significant at the 1% significance level?
2. Your classmate suggests measuring GDP per capita in euros instead of dollars. Even though you disagree with her proposal, you show her the effect of this adjustment on the slope. Show what happens to when you use *gdppcE=1.1\*gdppc* in regression (1).
3. Using regression (2), is there evidence that the relationship between *lnftmpop* and *lngdppc* is nonlinear?
4. Interpret the coefficient on *lackpf* in regression (3).
5. Using regression (3), Estimate the effect on *lnftmpop* of changing from *lackpf* = 7 (extremely limited political freedoms) to *lackpf* = 5 (some political freedoms), holding constant the values of the other regressors in regression (3).
6. Using regression (3), plot the estimated relationship between *lnftmpop* and *lackpf* (you can do this in your data program or by hand). What value of *lackpf* maximizes this relationship? Explain your result!
7. Using Table 1 discuss the evidence that ethnic diversity is associated with increases in terrorism, holding constant GDP per capita, religious diversity, and a measure of political freedoms.
8. Using Table 1, discuss the evidence that religious diversity is associated with increases in terrorism, holding constant GDP per capita, ethnic diversity, and a measure of politicalfreedoms? Interpret the sign of the coefficient on religious.
9. Does the coefficient on *lngdppc* differ in regressions (1), (2), and (3) in a substantively important way, that is, is the difference between the three estimates large in a real-world sense?
10. Which regression provides the best fit? Explain.
11. Your classmate argues that you should’ve included the variable unemployment in regression (3). Below is the correlation matrix. How do you expect you results to change after adding a new variable to your regression?

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | *lackpf* | *lackpf2* | *ln(gdp)* | *ethnic* | *religion* | *unempl* |
| *lackpf* | 1 |  |  |  |  |  |
| *lackpf2* | 0.977461 | 1 |  |  |  |  |
| *ln(gdp)* | -0.68398 | -0.59363 | 1 |  |  |  |
| *ethnic* | 0.248957 | 0.177132 | -0.48975 | 1 |  |  |
| *religion* | -0.08203 | -0.05151 | 0.046499 | 0.15986 | 1 |  |
| *unempl* | 0.249011 | 0.189001 | 0.78093 | 0.021419 | 0.109737 | 1 |